

THE CLAIMS

What is claimed is:

1. A method for preparing a surface of a semiconductor wafer which comprises:

polishing the wafer surface with a polishing solution that includes dispersed solid particles for mechanically abrading the wafer surface and a chemical agent for chemically attacking the wafer surface, with the polishing conducted to obtain planarization of the wafer surface; and

controllably stopping the chemical attack of the wafer surface by progressively introducing a rinsing solution onto the wafer surface to prevent chemical attack of the wafer surface beyond a desired planarization.

2. The method of claim 1 wherein the polishing solution has a basic pH and the rinsing solution has an acidic pH, so that the progressive introduction of the rinsing solution changes the pH of the polishing solution to terminate the chemical attack of the chemical agent on the wafer surface.

3. The method of claim 2 further comprising cleaning from the wafer surface residues resulting from the polishing.

4. The method of claim 3 wherein the cleaning step includes applying a cleaning solution comprising water to the wafer surface to remove residue(s) therefrom.

5. The method of claim 4 wherein the cleaning solution changes the pH of the polishing solution on the surface of the wafer to a neutral pH.

6. The method of claim 4 which further comprises drying the wafer prior to subsequent processing.

7. The method of claim 1 wherein the wafer is made of a silicon material comprising crystalline silicon, silica, glass or quartz.

8. The method of claim 1 wherein the polishing solution has a pH of between about seven and ten and the rinsing solution has a pH between about three and five

9. The method of claim 8 wherein the polishing solution has a pH of between about eight and ten and the rinsing solution has a pH that is equal or close to about four.

10. The method of claim 8 wherein the chemical agent comprises a nitrogen-containing base.

11. The method of claim 1 wherein the rinsing solution includes a surfactant to assist in the removal of residue by the rinsing solution.

12. The method of claim 8 wherein the surfactant solution is an aqueous solution containing a polyoxyalkylene alkyl ether surfactant.

13. The method of claim 11 wherein the surfactant is present in the surfactant solution at a critical micelle concentration of about 0.1% or less.

14. The method of claim 4 wherein the rinsing and the cleaning solutions each include deionized water.

15. The method of claim 1 wherein the stopping of the chemical attack occurs at a rinsing location that is different from that used for the polishing.

16. The method of claim 1 wherein the polishing includes applying a textured material to the wafer surface.

17. The method of claim 1 wherein the cleaning comprises applying a textured material to the wafer surface for removing the residue(s).

18. The method of claim 1 which further comprises treating the wafer surface to form an integrated circuit component that is hosted by material in the wafer layer.